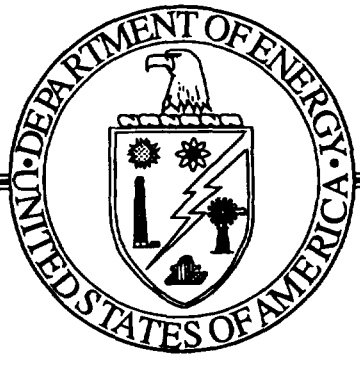
INITIAL SITE RESPONSE PLAN

HANFORD SITE



HANFORD SITE
MANAGEMENT RESPONSE PLAN
FOR THE
CHEMICAL SAFETY VULNERABILITY FIELD ASSESSMENT

Introduction

As part of the U.S. Department of Energy's (DOE) initiative to identify chemical safety vulnerabilities in the DOE complex, the Chemical Safety Vulnerability Core Working Group sponsored a series of field assessments at various DOE sites. A field assessment was conducted at the Hanford Site May 2-11, 1994. The field verification team visiting Hanford examined a broad range of facilities with special attention given to those facilities being transferred to, awaiting, or undergoing decontamination and decommissioning (D&D). Different types of chemical- and waste-handling facilities including laboratories, process facilities, water treatment plants, and waste treatment and storage facilities, were examined.

The Field Verification Report for the Chemical Safety Vulnerability review of the Hanford Site identified three chemical safety vulnerabilities. The three vulnerabilities ranged from low to medium priority with consequences of immediate to medium term. This Management Response Plan addresses each vulnerability identified in the Hanford Field Verification report and describes the planned corrective actions for each vulnerability.

Response Summary

Two of the chemical safety vulnerabilities identified at Hanford are associated with: (1) prolonged storage of large quantities of hazardous chemicals in shutdown or deactivated facilities; and (2) the loss of corporate knowledge that will be critical when equipment and systems that contain these chemicals are operated, breached, or disassembled during cleanup activities. As noted in the Hanford Field Verification Report, there has been significant progress at Hanford in reducing bulk storage of hazardous chemicals; however, this process is complicated by prolonged decision-making processes, the involvement of multiple stakeholders, and numerous requirements by regulatory agencies. Hanford will continue to monitor excess bulk storage of the chemicals and aggressively pursue the disposal of the chemicals. Once these chemicals have been disposed of, both the consequence and priority of the vulnerabilities will be greatly reduced or eliminated.

The third chemical safety vulnerability reflects weaknesses in some aspects of the various hazard analysis methodologies and differing work control systems used by the multiple contractors at the Hanford Site. This vulnerability is further complicated by the lack of a graded approach to differentiate between low hazard and high hazard work plan reviews and the lack of definitive guidance for hazard classification and safety analysis for nonnuclear facilities. Hanford will continue to support the development of sitewide hazard analysis programs such as Hanford Occupational Exposure Assessment Program (HOEAP) (commendable practice) and to clarify the requirements for conducting job hazard analysis, facility hazard analysis and hazard communication.

CHEMICAL SAFETY VULNERABILITY REVIEW
August 1994

Site/Facility: Hanford / PUREX and PFP **Vulnerability Number: CSVR-RL-HAN-01**

Point of Contact: **PUREX - Douglas G. Hamrick, WHC**
PFP - Eric C. Vogt, WHC
PUREX/PFP - Al Farabee, DOE-RL

Vulnerability:

- Large quantities of surplus hazardous chemicals are being stored for prolonged periods in production facilities that are being transitioned to deactivated status.

Summary of Vulnerability:

- Large quantities of nitric acid, aluminum nitrate, carbon tetrachloride, and tributylphosphate solvent are being stored at the PUREX Plant and at the Plutonium Finishing Plant (PFP) in outside tanks or drums. Prolonged storage of hazardous chemicals in shutdown or deactivated facilities may lead to personnel hazards or environmental releases caused by spills, evaporation, leakage from corroded tanks or drums, decomposition of chemicals, or lack of adequate administrative controls. These conditions and circumstances represent a low-priority vulnerability with a potential for short- to medium-term consequences.

Response:

- <u>PUREX HISTORY - NITRIC ACID</u> During operation of the PUREX and UO3 processes, nitric acid was recovered from various off-gas streams by absorption. Approximately 193,780 gallons of this recovered nitric acid are currently stored in six tanks at the PUREX facility. The six (304L stainless steel) tanks are Tank-U1, Tank-U2, Tank-P2, Tank-P3, Tank-P13, and Tank-P14. Tank P4 contains process flush solutions returned from UO3, rain/snow melt collected from the 203-A sumps, and steam condensate collected from the 203-A steam system. Corrective actions are as follows:

  1. **CHEMICAL STORAGE MONITORING** - The volumes of the PUREX nitric acid stored in Tanks-U1, U2, P2, P3, P13, P14, and P4 are monitored once per shift (three shifts per 24 hours) per Plant Operating Procedure P0-040-305. The U1 and U2 tanks are in U-Cell, which is a cell within the 202-A (PUREX) facility. The U-Cell sumps serve as secondary containment for these vessels. The P2, P3, P13, P14 and P4 tanks are in the 203-A facility, which serve as nitric acid and UNH storage for the PUREX/UO3 facilities. The P2, P3, P13, P14 and P4 tanks have secondary containment and sumps dedicated to them.

2. **DISPOSAL** - One option for disposition of the PUREX nitric acid contained in Tanks U1, U2, P2, and P3 is to export the approximate 183,000 gallons from PUREX to British Nuclear Fuels Limited, plc (BNFL plc) in Sellafield, England. The acid is planned to be shipped in ISO containers, which contain approximately 4,000 gallons each. Several tanks would be involved and would be reused until approximately 50 transfers had been completed. The Secretary has directed that an Environmental Assessment be conducted for the evaluation of the shipment option and to evaluate other alternatives.

3. **DISPOSAL** - The additional approximate 10,780 gallons of nitric acid contained in Tanks P13 and P14 are also expected to meet BNFL plc's operating specifications. Attempts to add this material to the export contract with BNFL plc, will be made after the material has been more thoroughly characterized. If not satisfactory, it will be neutralized and sent to underground storage.

4. **DISPOSAL** - The material contained in Tank P4 will be neutralized and sent to underground storage.

- <u>PUREX HISTORY - ORGANIC SOLVENT</u> During operation of the PUREX process, organic solvent, consisting of ~23% Tri-butyl Phosphate (TBP) and ~75% Normal Parrifin Hydrocarbon (NPH), was used in the solvent extraction operations. When the plant was shutdown following the Stabilization Campaign, approximately 21,000 gallons of this solvent remained in the building, stored in two canyon tanks (Tks-G5 & -R7). As part of the deactivation of the facility, the organic from these two canyon tanks was combined in a single bulk storage tank previously used to store the pure NPH (Tk-40). The organic was "cleaned up" during the Stabilization Campaign by contacting the solvent with an aqueous wash to remove the degradation products and radiological contaminants. Thorough laboratory analyses were completed on the materials stored in Tks-G5 & -R7; however, the combined mixture has not been sampled and analyzed. The original analyses demonstrated that the solvent is a non-RCRA waste and that it could be transported as a LSA material; however, due to the TBP concentration, the solvent is classified as a Washington State Designated Waste. Corrective actions are as follows:

  1. **CHEMICAL STORAGE MONITORING** - The volumes of the PUREX organic solvent stored in Tank Tk-40 are monitored once per shift (three shifts per day) per PUREX Plant Operating Procedure PO-040-305. Tank Tk-40 is located in the 211-A bulk chemical storage area directly north of the 202-A building. Tk-40 is surrounded by a ~5-foot-high concrete dike which will contain any potential leak or spill.

  2. **DISPOSAL** - The first option for disposal of the PUREX TBP/NPH is shipment to the Idaho National Engineering Laboratory (INEL) for use as a fuel substitute in the Westinghouse Idaho Nuclear Company (WINCO) calciner. To date, regulatory and policy concerns from the State of Idaho have stopped the shipment of the solvent until it can be delisted. Environmental testing (fish toxicity) is in progress as part of the delisting process and is expected to be completed by January 31, 1995.

  3. **DISPOSAL** - Other options for the disposal of this material are currently being evaluated. These options include offsite incineration at either a mixed-waste or at a low-level waste (LLW) incinerator or disposal onsite by a vendor-supplied steam reformer. In the event that the material can not be accepted and used by the WINCO calciner, one of these options will be chosen for the disposal of the PUREX organic.

3. **DISPOSAL** - Other options for the disposal of this material are currently being evaluated. These options include offsite incineration at either a mixed-waste or at a low-level waste (LLW) incinerator or disposal onsite by a vendor-supplied steam reformer. In the event that the material can not be accepted and used by the WINCO calciner, one of these options will be chosen for the disposal of the PUREX organic.

- <u>PFP HISTORY - NITRIC ACID, ALUMINUM NITRATE AND CARBON TETRACHLORIDE</u> Bulk chemical storage at the Plutonium Finishing Plant includes storage of approximately 3,000 gallons of 12M nitric acid and 8,000 gallons of aluminum nitrate stored in bulk storage tanks and approximately 2,640 gallons (forty-eight 55-gallon drums) of carbon tetrachloride. The bulk storage tanks are stainless steel, are located within diked containment areas, and are expected to be adequate for indefinite storage. The carbon tetrachloride (CCL_4) drums are stored outdoors on poly-spill pallets beneath a tent for protection from the weather, and the area is posted to warn workers of the potential hazards. PFP has determined that the subject chemicals are not needed in the immediate future for plant operations and has placed the products in the Declaration of Excess program.

  1. **CHEMICAL STORAGE MONITORING** - Until the surplus chemicals are removed from the facility, routine surveillances to detect and mitigate any leaks, ensure container integrity, and verify proper labeling will continue.

  2. **DISPOSAL** - Both the nitric acid and the aluminum nitrate have been placed in the Declaration of Excess Program since May 18, 1994. Currently, PFP is aggressively pursuing redeployment to offsite agencies or public sales. Due to the quality and the commercial application of the product, the completion of the redeployment of the nitric acid and aluminum nitrate is anticipated to be near term (prior to December 31, 1994).

  3. **DISPOSAL** - The drums of CCL_4 have been determined to be excess to the immediate needs of the plant and have been placed in the Excess Program. PFP will continue to pursue redeployment of the carbon tetrachloride until all recycling efforts have been exhausted. If redeployment of the material in the near term (December 31, 1994) proves to be not feasible, PFP will pursue other options, including declaring the material waste. If the carbon tetrachloride is determined to be waste, the material will be shipped from the facility within 90 days.

CHEMICAL SAFETY VULNERABILITY REVIEW
August 1994

Site/Facility: Hanford Site **Vulnerability Number: CSVR-RL-HAN-02**
Point of Contact: John B. Hall, DOE-RL
Lesley L. Reed, WHC

Vulnerability:

- Weaknesses exist in some aspects of the hazard analysis program at Hanford.

Summary of Vulnerability:

- Weaknesses exist in some aspects of the program and systems for performing various hazard analyses at the Hanford Site. The field verification team noted that the graded approach used to differentiate low-hazard work plans and packages from high-hazard plans and packages needs improvement. Differing hazard recognition and control systems implemented by multiple contractors, along with inconsistently performed facility hazard analyses, further contribute to an increased potential for personnel exposure to workplace hazards. These conditions and circumstances represent a medium-priority vulnerability with a potential for immediate consequences.

Response:

- HOEAP - The Department of Energy, Richland Operations Office (RL) and RL contractors have recognized a need for rigorous hazard analysis for the many work processes and operations which may result in chemical and nonchemical exposures to workers. The HOEAP, which was identified as a commendable practice by the Chemical Safety Vulnerability Field Verification Team has been developed to provide a consistent mechanism for identifying and documenting the chemical, physical, biological and ergonomic hazards present in the workplace. Once fully implemented the HOEAP will serve to significantly strengthen the hazard analysis program at Hanford. The HOEAP was developed by RL with input from the various Hanford contractors and was designed to be used by all Hanford contractors. Sitewide training on the HOEAP has previously been conducted and "field testing" is in progress so as to optimize its performance.

  A summary report of the HOEAP "field test" describing its strengths and weakness will be prepared by December 31, 1994, (near-term task) and the HOEAP will be revised accordingly. Once revised, DOE-RL will adopt the HOEAP as the primary mechanism for conducting hazard analysis for routine processes/operations and/or high-hazard operations. Revisions to and completion of the HOEAP will be completed by June 30, 1995, (short-term task) with implementation of the program by the line organizations occurring thereafter. Processes such as WHC Job Hazard Analysis (JHA) and Pacific Northwest Laboratories (PNL) Workplace Exposure Assessment (WEA) will continue to serve as the primary mechanism for conducting hazard analysis for nonroutine tasks and/or low-hazard operations.

- **HAZARD ANALYSIS AND COMMUNICATION** - DOE-RL Standard, "Hazard Analysis and Communication," has been drafted and is to be implemented by all RL contractors. The draft Hazard Analysis and Communication standard specifies the requirement for conducting workplace hazard analysis for both industrial safety and industrial hygiene related hazards and communication of the controls necessary to protect workers from the identified hazards. This Standard cross references the various Hanford industrial safety and health analysis methodologies, including the HOEAP and JHA. The Hanford task force creating the Hazard Analysis and Communication Standard has recommended a pilot program for determining the standard's workability. Estimated implementation date for this standard is on or before December 31, 1994, (near-term task).

- **FACILITY HAZARDS ANALYSIS** - As noted in the Hanford Field Verification Report, some facilities have been classified as low-hazard nonnuclear facilities due to the determination that they may have potential "minor onsite and negligible offsite impacts." Safety analysis documents, as described by DOE 5481.1B, have not been prepared for some low-hazard, nonnuclear facilities due to confusion regarding the numerous DOE Orders and OSHA standards that are either in draft or have been promulgated relative to conducting hazard assessments in these types of facilities. Specifically, the applicability of 29 CFR 1910.119, 29 CFR 1910.1200, 29 CFR 1910.120, 29 CFR 1910.1450; DOE 5480.10A (draft), DOE 5481.1B, DOE 5480.SAP (draft); EM Standard DOE-EM-STD-5502-94; Draft DOE Standard, "Process Safety Management for Highly Hazardous Chemicals," and Draft DOE Standard, "Analysis of Chemical Process Hazards," for conducting hazards analysis at nonnuclear low-hazard facilities needs to be determined. In the event that further guidance relative to the above issue is not evident by December 31, 1994, DOE-RL in conjunction with the various Hanford contractors, will develop a quality improvement team (QIT) to further evaluate this issue and draft a report to DOE-HQ - Office of Environment, Safety and Health (EH) detailing the issue and providing recommended resolution to the issue(s). The Hanford report will be issued to DOE-HQ EH by June 30, 1995, (short-term task).

CHEMICAL SAFETY VULNERABILITY REVIEW
August 1994

Site/Facility: Hanford Site/PUREX & PFP
Vulnerability Number: CSVR-RL-HAN-03

Point of Contact: PUREX - Douglas G. Hamrick, WHC
PFP - Eric C. Vogt, WHC
PUREX/PFP - Al Farabee, DOE-RL

Vulnerability:

- A loss of corporate knowledge may adversely affect cleanup activities at the Hanford Site.

Summary of Vulnerability:

- The loss of corporate knowledge may result in chemical safety vulnerabilities, particularly when systems or components are operated, breached, or disassembled. The loss of corporate knowledge is a result of personnel turnover, inconsistent configuration management, failure to capture and retain characterization data, and reductions in the scope of the training program. These conditions and circumstances increase the possibility for accidents or releases involving hazardous chemicals and represent a low- to medium-priority vulnerability with a potential for immediate- to short-term consequences. By the nature of this vulnerability, the severity of the consequences can be expected to increase with time.

Response:

- The majority of the chemicals involved in CSVR-RL-HAN-03, Section 3.b, will be disposed of as described in CSVR-RL-HAN-01, "Hanford Management Response Plan," which will reduce the severity of this vulnerability. However, due to the fact that chemical residues will still be present in the systems and components, actions to compensate for the loss of corporate knowledge have been provided.

  Both PUREX and PFP have previously implemented an organizational structure (Projectized) that will lessen the impact of the loss of corporate knowledge. The "new" organizational structure intermingles experienced personnel with less experienced personnel to maximize available corporate knowledge. Team concepts are being used for each subactivity whereby specialized experience is aligned to achieve subactivity completion.

  Westinghouse will continue to use team concepts, development of rigorous configuration control systems, and extensive safety reviews to minimize chemical safety vulnerabilities associated with the loss of "experienced" facility personnel.

ITEM #	VULNERABILITY/OBSERVATION	ACTION/PRODUCT	DUE DATE	RESPONSIBLE PERSON
HAN-01	Large quantities of surplus hazardous chemicals are being stored for prolonged periods in production facilities that are being transitioned to deactivated status.	PUREX-NITRIC ACID 1) CHEMICAL STORAGE MONITORING- Volumes of PUREX nitric acid stored in tanks will be monitored once per shift.	Ongoing	D. G. Hamrick
		2) DISPOSAL - Nitric acid contained in Tanks U1, U2, P2 and P3 will be dispositioned.	August 31, 1995*	D. G. Hamrick
		3) DISPOSAL - Additional 10,780 gallons of nitric acid contained in tanks P13 and P14 will be neutralized and sent to underground storage.	August 31, 1995	D. G. Hamrick
		4) DISPOSAL - Material contained in Tank P4 will be neutralized and sent to underground storage.	August 31, 1995	D. G. Hamrick
		PUREX-ORGANIC SOLVENT 1) CHEMICAL STORAGE MONITORING - Volumes of the PUREX organic solvent stored in Tank Tk-40 are monitored once per shift.	Ongoing	D. G. Hamrick
		2a) DISPOSAL - Environmental testing (fish toxicity).	January 31, 1995	D. G. Hamrick
		2b) DISPOSAL - Shipment to INEL for use as a fuel substitute in WINCO calciner.	Pending	D. G. Hamrick

*Dependent on outcome of environmental assessment.

		3) DISPOSAL - Offsite incineration at either a mixed-waste or low-level waste incinerator, or disposal onsite by a vendor-supplied reformer.	Options being evaluated	D. G. Hamrick
		PFP-NITRIC ACID, ALUMINUM NITRATE AND CARBON TETRACHLORIDE 1) CHEMICAL STORAGE MONITORING - **Routine surveillances until surplus chemical are removed from facility.**	**Ongoing**	**E. C. Vogt**
		2) DISPOSAL - **Product redeployment for nitric acid and aluminum nitrate completed.**	**Dec. 31, 1994**	**E. C. Vogt**
		3) DISPOSAL - Continue to pursue redeployment of carbon tetrachloride, or declare as waste.	Dec. 31, 1994	E. C. Vogt
HAN-02	Weaknesses exist in some aspects of the hazard analysis program at Hanford.	HOEAP HOEAP field test summary report completed.	Dec. 31, 1994	J. B. Hall
		Revised HOEAP in place.	June 30, 1995	J. B. Hall
		HAZARD ANALYSIS AND COMMUNICATION DOE-RL Standard, Hazard Analysis and Communication issued.	Dec. 31, 1994	J. B. Hall
		FACILITY HAZARD ANALYSIS Develop a Quality Improvement Team (QIT).	Dec. 31, 1994	J. B. Hall

		Issue Hanford report to DOE-HQ EH.	June 30, 1995	J. B. Hall
HAN-03	A loss of corporate knowledge may adversely affect cleanup activities at the Hanford Site.	The majority of chemicals involved will be disposed of as described in HAN-01.	Ongoing	D. G. Hamrick E. C. Vogt
		Teams, configuration control, and extensive safety reviews.	Ongoing	D. G. Hamrick E. C. Vogt